REMARKS

Claims 1 and 10-13 are pending in the application. Claims 1 and 10-13 stand rejected under 35 U.S.C. § 112 as being indefinite. Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Pedicini (U.S. Patent No. 5,362,577). Claims 1 and 10-12 stand rejected under 35 U.S.C. §102(b) as being anticipated by Vaillancourt (U.S. Patent No. 5,575,769). Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Frollini, Jr. et al. (U.S. Patent 4,608,148). Claim 1 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Frollini in view of Subsara et al. (U.S. Patent 4,543,175) or Marsoner et al. (U.S. Patent 5,160,420). Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaillancourt in view of Bartam et al. (U.S. Patent 5,143,621). In view of the amendments and remarks made herein, Applicant respectfully requests reconsideration and withdrawal of these rejections and passage of this case to allowance.

Applicant has amended the claims to more clearly define and distinctly characterize applicant's novel invention. Specifically, claim 1 has been amended into *Jepson* format (*Manual of Patent Examining Procedure*, § 2129 (8th ed., rev. 4, Oct. 2005)) in order to claim the structure of the combination glass pH electrode. The claimed invention is thus a combination glass pH electrode improved by the described vent. This language is based upon the following teaching of the application as filed: "The present invention is thus directed to a combination glass pH electrode, the standard potential of which is stabilized by means of one or more of the following structural modifications:" (specification page 6, lines 3-5) "incorporation of a reference electrolyte compartment vent that minimizes moisture loss or pick-up from the surroundings yet admits sufficient air to permit flow of reference electrolyte through the liquid junction under the influence of gravity" (page 7, lines 1-4).

Claims 10 and 12 have been amended to correct formal matters. Claim 11 has been amended to claim the tube inserted into the perforated septum. This language is based upon the following teaching of the application as filed: "Advantageously the tube in the septum has an inner diameter of about 0.5 mm and a length of about 10 mm." (page 8, lines 18-19).

The amendments presented herein add no new matter. Applicants respectfully submit that the amendments presented herein do not raise new issues requiring further search. Applicants respectfully request entry and consideration of the foregoing amendments and reconsideration of the application in view of the following remarks, which are intended to place this case in condition for allowance.

I. Claims 1 and 10-13 do particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

At page 2, paragraph 3 of the instant Office Action, Claims 1 and 10-13 stand rejected under 35 U.S.C. § 112 as being indefinite. The Examiner contends that the claims fail to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses this rejection.

The Examiner contends that the terms "minimizes" and "sufficient" used in Claim 1 do not set specific metes and bounds, so the terms are unclear. Applicant uses these terms as functional limitations. *The Manual of Patent Examining Procedure*, § 2173.05(g) (8th ed., rev. 4, Oct. 2005) defines a functional limitation as follows:

A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients). There is nothing inherently wrong with defining some part of an invention in functional

terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971).

A functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process **to define a particular capability or purpose that is served by the recited element**, ingredient or step. (Emphasis added.)

The particular capability or purpose for which the vent in Claim 1 "minimizes moisture loss or pick-up from the surroundings" and yet "admits sufficient air to permit flow of added reference electrolyte through the liquid junction under the influence of gravity" is to keep the electrolyte fluid constant, thus stabilizing the reference potential, thus producing a combination glass pH electrode that needs no calibration for up to two years, which is the claimed invention. See data in Figure 6 of the specification where the average rate of change in reference potential with vent of current invention is very small (approximately 1.5-4.5 mV over two years), compared to Figure 7 where the average rate of change in reference potential without vent (industry standard) is much larger over a much shorter period of time (approximately 4.5-14.5 mV over two months). The standard pH electrode without vent of current invention would thus require calibration more often than every two years. One of ordinary skill in the art should be able to determine the size of vent necessary to produce a stable reference potential so that the pH electrode does not need calibration for up to two years. Therefore, "minimizes moisture loss or pick-up from the surroundings" and "admits sufficient air" are not indefinite because the terms define a range of air flow through the vent that would produce a pH electrode that does not require calibration for up to two years.

Functional limitation in claim language is accepted use. For example, Claim 11 of Pedicini states, "The apparatus of claim 1 wherein said size of said gas exit hole is **sufficiently small to prevent excessive carbon dioxide intake** from the atmosphere." (Emphasis added.) Claim 12 of Pedicini states, "The apparatus of claim 1 wherein said size of said exit hole is **sufficiently small to prevent excess liquid loss** from said cell." (Emphasis added.) So a functional limitation is adequate to provide clear metes and bounds for a claim.

Claims 1 has been amended to provide antecedent support for the terms listed on page 3, paragraphs 5 and 8, and page 4, paragraph 11 of the instant Office Action. Claim 10 has been amended to substitute "minimize diffusion" for "reduce the rate at which moisture can diffuse," and Claim 12 has been amended to substitute "minimize diffusion" for "retard diffusion" so that their language is no longer broader in scope than the original language of Claim 1. Amended Claims 10 and 12 using the terms "minimize" and "sufficient" are not indefinite for the same reasons as given for Claim 1 above.

II. Claim 1 is Novel over Pedicini

At page 4, paragraph 13 of the instant Office Action, Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Pedicini (U.S. Patent No. 5,362,577). The Examiner contends that Pedicini discloses all of the claim limitations. Applicant respectfully traverses this rejection.

Applicants' amended claim is directed to a **combination glass pH electrode wherein the improvement comprises** incorporation of a reference electrolyte compartment vent that minimizes moisture loss or pick-up from the surroundings yet under the influence of a partial vacuum created inside the compartment, admits sufficient air to permit flow of added reference electrolyte through the liquid junction under the

influence of gravity. The claimed combination glass pH electrode is now further defined by having the reference electrolyte kept constant and the standard potential of the reference electrode stabilized, and needing no calibration for up to two years. Pedicini discloses a battery case incorporating a vent **16** (see abstract), but in no way teaches or suggests incorporating such a vent into a combination glass pH electrode. Since applicant has amended Claim 1 to explicitly claim the structure of the combination glass pH electrode, Pedicini fails to teach or suggest each and every element of Claim 1.

III. Claims 1 and 10-12 are Novel over Vaillancourt

At page 5, paragraph 15 of the instant Office Action, Claims 1 and 10-12 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Vaillancourt (U.S. Patent No. 5,575,769). The Examiner contends that Vaillancourt discloses all of the claim limitations. Applicant respectfully traverses this rejection.

Applicants' amended Claim 1 is directed to a **combination glass pH electrode wherein the improvement comprises** incorporation of a reference electrolyte compartment vent that minimizes moisture loss or pick-up from the surroundings yet under the influence of a partial vacuum created inside the compartment, admits sufficient air to permit flow of added reference electrolyte through the liquid junction under the influence of gravity. The claimed combination glass pH electrode is now further defined by having the reference electrolyte kept constant and the standard potential of the reference electrode stabilized, and needing no calibration for up to two years. Vaillancourt discloses a smooth-tipped cannula for piercing a slit septum (column 1, lines 4-6), but in no way teaches or suggests incorporating such a device as a vent in a combination glass pH electrode. Since applicant has amended claim 1 to explicitly claim the structure of the combination glass pH electrode, Vaillancourt fails to teach or suggest each and every element of Claim 1.

Claims 10 and 12 of the current invention are dependent on Claim 1, and amended Claim 1, as discussed above, is novel over Vaillancourt under 35 U.S.C. 102(b). As such, Claims 10 and 12 should also be novel. Even so, Claims 10 and 12 are novel based upon the prior art cited by the Examiner. The perforated septum of Claim 10 and the slit septum of Claim 12 are now incorporated into the combination glass pH electrode of Claim 1. Vaillancourt describes a slit septum (column 1, lines 4-6), but in no way suggests combining the slit septum with a pH electrode. Therefore, Vaillancourt fails to teach or suggest each and every element of Claims 10 and 12.

Amended Claim 11 is dependent on Claim 10, which is dependent on Claim 1, both of which, as discussed above, are novel over Vaillancourt. As such, Claim 11 should also be novel. Even so, Claim 11 is novel based upon the prior art cited by the Examiner. Amended Claim 11 is directed to a combination glass pH electrode as in claims 1 and 10, further comprising **a removable tube** inserted into the perforation of the elastomeric septum closure, said tube having an inner diameter of about 0.5 mm and a length of about 10 mm. Vaillancourt discloses a smooth-tipped cannula for piercing a slit septum (column 1, lines 4-6), but in no way teaches or suggests incorporating such a tube inserted into a slit septum as a vent in a combination glass pH electrode. Therefore, Vaillancourt fails to teach or suggest each and every element of Claim 11.

IV. Claim 1 is Novel over Frollini, Jr. et al.

At page 6, paragraph 19 of the instant Office Action, Claim 1 stands rejected under 35 U.S.C. § 102(b) as being anticipated by Frollini, Jr. et al. (U.S. Patent No. 4,608,148). The Examiner contends that Frollini et al. discloses all of the claim limitations. Applicant respectfully traverses this rejection.

The Examiner contends that the unspecified dimensions of hole 50 in Figure 1 of Frollini et al. would meet the limitations of Claim 1 for "minimizing moisture loss or pick-up" while "admitting sufficient air," giving the claim language its broadest reasonable interpretation. Applicant submitted in section I above that "minimizes" and "sufficient" are functional limitations which define the size of the vent of current invention to allow a range of air flow through the vent necessary to produce a sufficiently stable reference potential so that the pH electrode of current invention does not require calibration for up to two years. Frollini et al. does not have any specifications or claims for the size of hole 50 (column 4, lines 7-11), nor does it discuss the stability of the electrode's signal in terms other than the effect of temperature during measurements (column 1, lines 24-32, 47-50).

Comparing Figure 1 in Frollini with Figures 1 and 3 in the current application, one can see that hole 50 is large, but vent tube 2 in Figure 1 and slit 21 in Figure 3 are both very small relative to the size of the entire apparatus. The size of the hole in Frollini relative to the entire apparatus shown appears to be that found in standard pH electrodes without vent of current invention, such as ones which produced the large standard potential drift in Figure 7 of the specification. Frollini in no way teaches or suggests that hole 50 can minimize moisture loss or pick-up to produce a stable reference potential so that the pH electrode does not require calibration for up to two years. Therefore, Frollini et al. fails to teach or suggest each and every element of Claim 1.

V. Claim 1 is Not Obvious over Frollini in view of Subsara et al. or Marsoner et al.

At page 7, paragraph 22 of the instant Office Action, Claim 1 in the alternative stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Frollini et al. in view of Subsara et al. (U.S. Patent No. 4,543,175) or Marsoner et al. (U.S. Patent No.

5,160,420). The Examiner contends that Claim 1 is obvious when compared to Frollini in view of Subsara or Marsoner. Applicant respectfully traverses this rejection.

The Examiner contends that in view of the hole of Frollini and the refill sleeve of Subsara, it would be obvious to combine the two teachings to produce the invention of Claim 1, even though Subsara does not teach or suggest using the sleeve as a partial obscurant, but only as a seal (column 2, lines 10-15). The Examiner suggests that it is unnecessary for the prior art to disclose doing so as long as the art were capable of providing the specified function. The Board of Patent Appeals and Interferences gave the following opinion on combining references to find obviousness in Ex parte Clapp, 227 USPQ 972:

> To support the conclusion that the claimed combination is directed to obvious subject matter, either the **references must expressly or impliedly suggest the claimed combination** or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references... It is to be noted that simplicity and hindsight are not proper criteria for resolving the issue of obviousness. (Emphasis added.)

While, using hindsight, one can see how a hole as in Frollini combined with a partially obscuring sleeve may reduce moisture loss and contamination while allowing enough air to pass through so that the reference liquid junction can flow under gravity, it cannot be said that Frollini in view of Subsara expressly or impliedly suggest the described vent in Claim 1 resulting in production of a pH electrode possessing long-term stability of the standard potential. The Examiner admits that Subsara does not teach using the sleeve to partially obscure the hole. Therefore, Claim 1 is not obvious under 35 U.S.C. § 103(a).

The Examiner suggests that it would be obvious to utilize the teaching of Marsoner for the electrode of Frollini so that reference electrolyte can be automatically delivered and undesirable mixing of sample and electrolyte can be avoided. Marsoner teaches that reference electrolyte can be automatically delivered to and released from a reference electrode via a series of sealed hoses 21 and 22. When the reference electrolyte is not being changed, valve 23 is closed and the reference electrode is a sealed system (column 6, lines 15-45). Marsoner does not suggest that sealed hoses 21 and 22 will result in production of a pH electrode that needs no calibration for up to two years. The sealed system of Marsoner maximally "minimizes moisture loss or pick-up from the surroundings," but does not teach or suggest "**admits sufficient air** to permit flow of added reference electrolyte through the liquid junction **under the influence of gravity.**" (emphasis added) in order to produce a pH electrode possessing long-term stability of the standard potential.

As explained in the current application, the reference electrode must allow electrolyte to flow through the liquid junction, in this case under influence of gravity, to prevent back-diffusion of sample into the reference electrode (paragraph 61). For this flow to occur, the reference electrolyte compartment must be vented to the atmosphere (paragraph 61). The sealed system of Marsoner does not allow this feature. Marsoner uses high pressure to add reference electrolyte (column 6, lines 26-29). So it cannot be said that the hole of Frollini and the sealed hoses of Marsoner teach or suggest the described vent in Claim 1 resulting in production of a pH electrode possessing long-term stability of the standard potential. Therefore, Claim 1 is not obvious under 35 U.S.C. § 103(a).

VI. Claim 13 is Not Obvious over Vaillancourt in view of Bartam et al.

At page 8, paragraph 24 of the instant Office Action, Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaillancourt in view of Bartam et al. (U.S. Patent No. 5,143,621). The Examiner contends that Claim 13 is obvious when compared to Vaillancourt in view of Bartam et al. Applicant respectfully traverses this rejection.

Amended Claim 1 specifically claims a combination glass pH electrode that incorporates a reference electrolyte compartment vent as further defined in Claim 12 and then Claim 13. Vaillancourt discloses a slit septum (column 1, lines 4-6), but in no way teaches or suggests incorporating the slit septum as a vent in a combination glass pH electrode. Bartam describes a glass reaction vial sealed with a Teflon-lined silicone septum (column 3, lines 57-58), but in no way teaches or suggests incorporating the silicone septum as a vent in a pH electrode. Neither Vaillancourt nor Bartam, taken together or separately, teach, suggest, or predict that the septum comprising a silicone elastomer described in Claim 13 will produce a combination pH electrode with a stable standard potential . As such, Claim 13 is not obvious under 35 U.S.C. § 103(a).

VII. CONCLUSION

For the foregoing reasons, Applicant respectfully requests entry and consideration of the foregoing amendments, reconsideration, withdrawal of the 35 U.S.C. § 112 second paragraph, 35 U.S.C. § 102(b), and 35 U.S.C. § 103(a) rejections, and allowance of the case. To the extent that the Examiner believes that it would facilitate allowance of the case, the Examiner is requested to telephone the undersigned at the number shown on page 1.

EXTENSION OF TIME PETITION

Applicant hereby petitions for a one month extension of time for the filing of this response. The three-month response deadline was January 14, 2006.

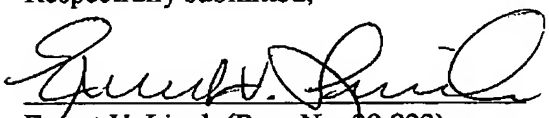
FEE AUTHORIZATION

Please charge all fees due in connection with this filing to our Deposit Account – No. 19-0733.

CERTIFICATE OF FACSIMILE TRANSMISSION

The undersigned hereby certifies that this correspondence was submitted by facsimile in the USPTO on the date shown on Page 1.

Respectfully submitted,



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